

ABSTRACT OF THE DISCLOSURE

A method and apparatus for mechanical simulation using polygonal shape data in which at least a portion of a shape is approximated by a combination of a plurality of polygons. Shape data of analytic surface expression is obtained by fitting partial sets of the polygons to analytic surfaces. The analytic surfaces may include at least one of a cone, torus and cylinder. An assembly model is generated based on a pair relationship including a coaxial relationship between the analytic surfaces. The assembly model is expressed as a positional relationship among a plurality of components thereof. A kinematics simulation is performed by computing positions of the components according to the positional relationship. At least one or more of the polygons may be selected from the polygonal shape data in accordance with a predetermined selection criteria. The apparatus may include calculation units configured to calculate first and second representations, respectively, of first and second analytic surfaces of first and second components, respectively. An interference check unit in the apparatus may be configured to check the presence/absence of geometric interference between the first and second components.